

**Southern California Association of Governments**

# **Modeling Assumptions**

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**Discussion**  
RTP TAC Meeting  
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**System Metrics Group, Inc.**

# Modeling assumptions address future scenarios and plan impacts



- Assumptions are divided into several categories:
  - Freeway free flow speeds
  - Freeway capacity
  - Auto costs (perceived)
  - Transit fares and headways
  - TDM
  - Value of time (perceived)

## The 2000 model uses the following assumptions for free flow speeds and capacity for freeways

### **FREEWAY/EXPRESSWAY FREE FLOW SPEED (2000 Model Validation)**

Area Type	AT1	AT2	AT3	AT4	AT5	AT6	AT7
Freeway/HOV	60	62	62	65	65	70	65
Expressway	PS	PS	PS	PS+5	PS+5	PS+5	PS+5
Fwy-Fwy Connector	45	45	50	50	55	55	55
On-Ramp (peak)	15	15	20	20	30	35	35
On-Ramp (off-peak)	25	25	30	30	35	35	35
Off-Ramp	25	25	30	30	35	35	35

### **FREEWAY CAPACITY (2000 Model Validation)**

Area Type	AT1	AT2	AT3	AT4	AT5	AT6	AT7
Freeway/HOV (pcplph)	2,100	2,100	2,100	2,100	2,100	2,100	2,100
Fwy-Fwy Connector (pcplph)	2,000	2,000	2,000	2,000	2,000	2,000	2,000
On-Ramp (first lane)	720	720	720	720	1,400	1,400	1,400
On-Ramp (additional lane)	480	480	480	480	600	1,400	1,400
On-Ramp (off-peak)	1,300	1,300	1,300	1,300	1,400	1,400	1,400

Area type based on population/employment density and land use characteristics

AT1	Core
AT2	Central Business District
AT3	Urban Business District
AT4	Urban
AT5	Suburban
AT6	Rural
AT7	Mountain

## Auto cost assumptions reflect perceived, not real costs. These are different from the values used for benefit cost analysis



### AUTO OPERATING COST CALCULATION (2000 Model Validation)

Parameter	Value	Based on
2000 On-road miles/gallon	22	MPG for SCAG Region (CEC)
Avg Year 2000 cents/gallon	171	Price & volume sold by fuel grade
Converted to 1989 cents/gallon	128	(See Table G-2)
FUEL COST (1989 cents/mile)	5.804	gallon/mile * cents/gallon
OTHER COSTS (1989 cents/mile)	4.704	Repairs, maintenance, tires, accessories
TOTAL COST/MILE (1989 cents)	10.507	

1989/2000 CPI = 128.3/171.6

(CPI for All Urban Consumers for Los Angeles-Riverside-Orange County, CA)

## Transit fare and headway coding are extensive and can be summarized as follows

### Transit Assumptions (Base Year 1997 in 2001 RTP)

Mode	Average Peak Speed (miles/hour)	Boarding Fare (2000 \$)	Peak Headway (minutes)	Off-Peak Headway (minutes)
Commuter Rail	42	\$2.51	52	523
Light/Heavy Rail	29	\$0.85	6	8
Busway*	Frwy = 55	\$0.85		
Rapid Bus				
Express Bus	20	\$0.85	17	50
Local Bus	17	\$0.85	15	21

\* Busway includes busway portion of route only

## Transit fare and headway coding are extensive and can be summarized as follows

### Transit Assumptions (2025 Plan in 2001 RTP)

Mode	Average Peak Speed (miles/hour)	Boarding Fare (2000 \$)	Peak Headway (minutes)	Off-Peak Headway (minutes)
Commuter Rail	44	\$2.97	32	46
Light/Heavy Rail	30	\$0.75	7	9
Busway*	Frwy = 55 Street = 30			
Rapid Bus	22	\$0.75	12	12
Express Bus	21	\$0.75	19	53
Local Bus	15	\$0.75	14	20
MagLev**	150	\$5.25	5	5

\* Busway includes busway portion of route only

\*\* Maglev also charged fare of \$0.05/mile

**Transit fare and headway coding are extensive and can be summarized as follows**

## Transit Assumptions (2000 Model Validation)

<b>Mode</b>	<b>Average Peak Speed (miles/hour)</b>	<b>Boarding Fare (2000 \$)</b>	<b>Average Peak Headway (minutes)</b>	<b>Average Off-Peak Headway (minutes)</b>
Commuter Rail	44	\$2.97	49	125
Light/Heavy Rail	30	\$0.75	6	8
Busway*	Frwy = 55	\$0.75		
Rapid Bus	22	\$0.75	9	11
Express Bus	21	\$0.75	22	54
Local Bus	15	\$0.75	19	24

\* Busway includes busway portion of route only

## The 2001 RTP (and 2000 Model Validation) assumed certain TDM impacts on mode shares

### TDM ASSUMPTIONS (from 2001 RTP)

	1990	Base Year	2000 <sup>4</sup>	Baseline (Conformity)		Plan	
		1997		2010	2025	2010	2025
Work at Home <sup>1</sup> (H-W trips) <i>vs. 1990 rate</i>	2.70%	3.12% <i>0.42%</i>	3.32% <i>0.62%</i>	3.32% <i>0.62%</i>	3.32% <i>0.62%</i>	4.10% <i>1.40%</i>	5.60% <i>2.90%</i>
Telecommute <sup>1</sup> (H-W trips) <i>vs. 1990 rate</i>	2.91%	3.20% <i>0.29%</i>	3.34% <i>0.43%</i>	3.34% <i>0.43%</i>	3.34% <i>0.43%</i>	3.83% <i>0.92%</i>	4.72% <i>1.81%</i>
Vanpool <sup>2</sup>	0.00%	0.00%	0.00%	0.00%	0.00%	0.80%	0.80%
Jitneys <sup>2</sup>	0.00%	0.00%	0.00%	0.00%	0.00%	0.20%	0.20%

	Plan (LA County)	
	2010	2025
H-W trips shifted from SOV to Transit <sup>3</sup>	1.50%	1.50%
Non-H-W trips shifted from SOV to Transit <sup>3</sup>	1.00%	1.00%

1) The estimation for work at home in 1990 and 1997 is based on Bureau of Labor Statistics. May 1997. Current Population Survey. The annual compound growth rate for work at home between 1990-1997 is 2.1%. This is the percent of H-W person trips. The estimate for telecommute in 1991 and 1997 is based on Bureau of Labor Statistics. May 1997. Current Population Survey. The annual compound growth rate for telecommute between 1991-1997 is 1.4%. The 2.91% telecommute estimate is backcasted from the 1991 estimate. This is the percentage of H-W person trips.

2) 12-person vanpool capacity is assumed with an average 80% occupancy rate. Vehicle trips associated with jitneys are assumed zero.

3) The estimated shifts from drive alone to transit in Los Angeles County reflect the transit restructuring program.

4) The 2000 Model Validation used the same assumptions for year 2000 as in the 2001 RTP



**It is also important to note that the value of time used in the model represents perceived, not economic value**

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- **The values used are different from economic values used to estimate savings from delay**
- **Households are divided into three income categories: low, medium, high. Value of time is calculated as a percentage of income (e.g. medium income households - 25% of hourly wage).**